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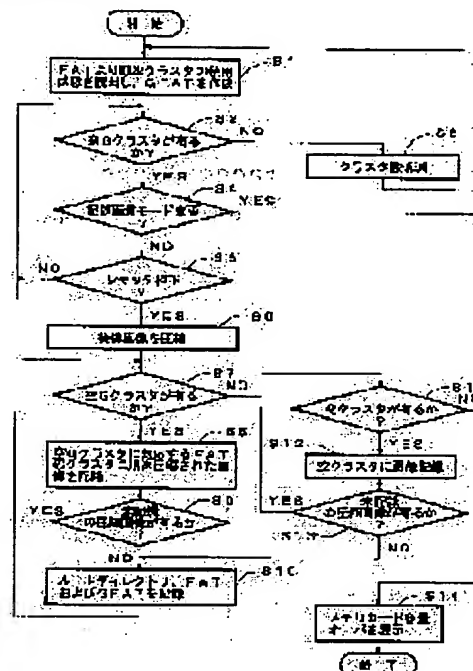
(72)Inventor : NASU MASAMI

(54) FILE MANAGEMENT PROGRAM AND RECORDING MEDIUM

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a file management program capable of recording on a recording medium in a short time and the recording medium.

SOLUTION: A file management program for managing information to be recorded on the recording medium partitioned into a plurality of clusters by an MS-DOS method, reads out usage states of a predetermined number of clusters in turn from an FAT (File Allocation Table) recorded on the recording medium, adds new G cluster numbers to the read out predetermined number of the clusters, creates a GFAT by adding usage states of the G cluster numbers based on the read out usage states of the clusters, repeats creations of the GFAT by reducing the predetermined numbers if the usage states of the G clusters have been fully used, searches in turn the G cluster numbers which have not been used when recording information on the recording medium, and records the information followed by the clusters with the predetermined number of the cluster numbers corresponding to the obtained numbers of clusters which have not been used.



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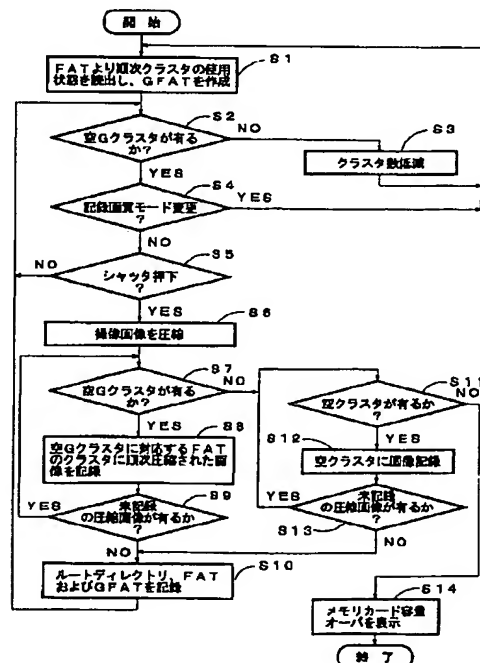
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(54) 【発明の名称】 ファイル管理プログラムおよび記録媒体

(57) 【要約】

【課題】 データを短時間で記録媒体に記録できるようにしたファイル管理プログラムおよび記録媒体を提供する。

【解決手段】 複数のクラスタに分割された記録媒体にMS-DOS方式によって記録する情報の管理を行なわせるファイル管理プログラムにおいて、前記記録媒体に記録されているFATより順次所定数のクラスタの使用状況を読み出し、読み出した所定数のクラスタに新たなGクラスタ番号を付与し、付与したGクラスタ番号に対する使用状況を前記読み出したクラスタの使用状況に基づいて付与してGFATを作成し、Gクラスタの使用状況が全て使用済である場合は前記所定数を低減させてGFATの作成を繰返し、前記記録媒体への情報の記録時には使用状況が空であるGクラスタ番号を順次サーチし、得られた空のGクラスタ番号に対応する前記所定数のクラスタ番号のクラスタに連続して情報を記録させる。



【特許請求の範囲】

【請求項1】 複数のクラスタに分割された記録媒体にMS-DOS方式によって記録する情報の管理を行なわせるファイル管理プログラムにおいて、

前記記録媒体に記録されているFATより順次所定数のクラスタの使用状況を読み出し、読み出した所定数のクラスタに新たなGクラスタ番号を付与し、付与したGクラスタ番号に対する使用状況を前記読み出したクラスタの使用状況に基づいて付与してGFATを作成し、Gクラスタの使用状況が全て使用済である場合は前記所定数を低減させてGFATの作成を繰返し、前記記録媒体への情報の記録時には使用状況が空であるGクラスタ番号を順次サーチし、得られた空のGクラスタ番号に対応する前記所定数のクラスタ番号のクラスタに連続して情報を記録させる、ようにしたことを特徴とするファイル管理プログラム。

【請求項2】 前記記録媒体への情報の記録時に、使用状況が空であるGクラスタが無いときは、前記FATより使用状況が空であるクラスタ番号をサーチし、得られた空のクラスタ番号に対応するクラスタに情報を記録させるようにしたことを特徴とする請求項1記載のファイル管理プログラム。

【請求項3】 前記GFATを前記記録媒体とは別のメモリに記録させるようにしたことを特徴とする請求項1または2記載のファイル管理プログラム。

【請求項4】 前記Gクラスタを構成する前記クラスタの数を、前記記録媒体に応じて変更可能であることを特徴とする請求項1、2または3記載のファイル管理プログラム。

【請求項5】 前記Gクラスタを構成する前記クラスタの数を、前記記録媒体の総記録容量に応じて決定されることを特徴とする請求項1、2または3記載のファイル管理プログラム。

【請求項6】 前記Gクラスタを構成する前記クラスタの数を、デジタルカメラの記録する画質モードによって決定されることを特徴とする請求項1、2または3記載のファイル管理プログラム。

【請求項7】 前記記録媒体に記録される情報がデジタルカメラで撮像された画像情報であることを特徴とする請求項1、2、3、4または5記載のファイル管理プログラム。

【請求項8】 請求項1乃至7のいずれかに記載のファイル管理プログラムを記載した記録媒体。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は記録媒体にMS-DOS方式で記録する情報の管理を行なわせるファイル管理プログラムおよび記録媒体に関する。

【0002】

【従来の技術】従来使用されているMS-DOS方式に

よる記録媒体に情報を記録する方法を図3～図5を参照して説明する。

【0003】図3において、8は情報を記録する記録媒体であるメモ리카ードを示しており、8Aはマスタブートセクタ領域で、シリンダ、ヘッドトラック、セクタトラック等のパラメータが記録され、8Bはパーティションセクタ領域で、記録媒体の物理的な記録最小単位であるセクタサイズ、クラスタ当たりのセクタ数、FAT（File Allocation Table）数等のDOSファイル管理に必要なパラメータが記録されている。

【0004】8CはFATであり、クラスタの使用状況が記録され、FAT2にはFAT1のコピーが記録され、FAT1の記録が異状の場合はFAT2に記録された値を使用する。

【0005】8Dはルートディレクトリ領域で、図5に示すように、8Eのデータ領域に記録されたファイルのファイル名、拡張子、属性、記録時刻、記録日時、開始クラスタ番号、ファイルサイズ等が記録される。

【0006】図4は8Cに示すFATの記録例を示している。FAT8Cのアドレスはデータ領域8Eのクラスタ番号に対応しており、クラスタ番号に対応するクラスタの使用状況が記録される。

【0007】図4に示すように、使用状況が「000」は未記録、「FFF」は最終データを記録したクラスタを示し、「000」および「FFF」以外の記録は次に続いて記録されているクラスタ番号が記録される。

【0008】そこで、図5で示した開始クラスタの番号が「000」の場合は、このファイルのデータは、図4で示されるように、クラスタ番号「000」～「004」、「006」および「007」に記録されていることを示している。また、開始クラスタ番号が「010」のファイルはクラスタ番号「010」と「011」のクラスタに記録されていることを示している。

【0009】したがって、データ領域8Eに記録されているデータを読み出すには、まずルートディレクトリ領域8Dに記録されているファイル名をサーチし、開始クラスタの番号を読み出し、読み出したクラスタ番号に対応するデータ領域8Eのクラスタより記録されているデータを読み出す。

【0010】クラスタよりデータの読み出しが終了すると読み出したクラスタに続いてデータが記録されているか否かをFAT8Cにアクセスして判定し、記録が「FFF」以外の場合は記録されているクラスタ番号に対応するクラスタに記録されているデータの読み出しを続行する。

【0011】また、新たなファイルデータを記録する時は、FAT8Cのアドレスを先頭から順次サーチし、使用状況が「000」、すなわち未記録のクラスタを見出し、見出したクラスタにデータを記録する。

【0012】したがって、図4で示される場合は、デー

タ領域8Eのクラスタ番号「005」にデータが記録され、FAT8Cの使用状況には次の未記録のクラスタ番号「008」が記録されると共にデータ領域8Eのクラスタ番号「008」にファイルデータが記録される。

【0013】またファイルデータの記録が終了すると最終データが記録されたFAT8Cのクラスタ番号に対応する使用状況を「FFF」と記録して終了する。

【0014】

【発明が解決しようとする課題】MS-DOS方式によって記録媒体にデータを記録する場合は、前述したように、FATより空領域であることを示す「000」を検索し、「000」が見つかった場合は、そのクラスタ番号より記録媒体の論理アドレスを求め、求められた論理アドレスに対して書き込みを行なう。

【0015】クラスタ番号より論理アドレスの算出は、前述したパーティションセクタ領域8Aに記録されているDOSパラメータにより行なう。したがって、1ファイルが複数のクラスタによって構成される場合は、空クラスタの検索および論理アドレスの算出をクラスタ毎に行なう必要があり、ファイル記録処理に長時間を要する。

【0016】クラスタのサイズはDOSパラメータによって変更可能であるが、クラスタサイズを大きくすると、空クラスタの検索および論理アドレスの算出する回数が少なくなってファイル記録処理時間を低減することができるが、クラスタは最小記録単位であるため、必要以上にクラスタサイズを大きくするとファイルの最終のデータが記録されるクラスタにデータが記録されない空領域が発生し、記録媒体の使用効率を低下させる。

【0017】本発明はデジタルカメラで撮像した画像データ等の多量のデータを短時間で記録媒体に記録できるようにしたファイル管理プログラムおよび記録媒体を提供することを課題とする。

【0018】

【課題を解決するための手段】請求項1の発明においては、複数のクラスタに分割された記録媒体にMS-DOS方式によって記録する情報の管理を行なわせるファイル管理プログラムにおいて、前記記録媒体に記録されているFATより順次所定数のクラスタの使用状況を読み出し、読み出した所定数のクラスタに新たなGクラスタ番号を付与し、付与したGクラスタ番号に対する使用状況を前記読み出したクラスタの使用状況に基づいて付与してGFATを作成し、Gクラスタの使用状況が全て使用済である場合は前記所定数を低減させてGFATの作成を繰返し、前記記録媒体への情報の記録時には使用状況が空であるGクラスタ番号を順次サーチし、得られた空のGクラスタ番号に対応する前記所定数のクラスタ番号のクラスタに連続して情報を記録させる。

【0019】請求項2の発明においては、前記記録媒体への情報の記録時に、使用状況が空であるGクラスタが

無いときは、前記FATより使用状況が空であるクラスタ番号をサーチし、得られた空のクラスタ番号に対応するクラスタに情報を記録させる。請求項3の発明においては、前記GFATを前記記録媒体とは別のメモリに記録させる。

【0020】請求項4の発明においては、前記Gクラスタを構成する前記クラスタの数を、前記記録媒体に応じて変更可能にする。請求項5の発明においては、前記Gクラスタを構成する前記クラスタの数を、前記記録媒体の総記録容量に応じて決定する。

【0021】請求項6の発明においては、前記Gクラスタを構成する前記クラスタの数を、デジタルカメラの記録する画質モードによって決定する。請求項7の発明においては、前記記録媒体に記録される情報がデジタルカメラで撮像された画像情報とする。

【0022】

【発明の実施の形態】本発明の実施の形態を図1～図6を参照して説明する。図1は本発明の実施例の構成図、図2は同実施例の動作フローチャート、図3はメモ리카ードの構成図、図4はFATの記録例、図5はルートディレクトリの説明図、図6はGFATの説明図である。

【0023】図1は本発明をデジタルカメラに適用した実施例の構成図で、1は撮像部、2は撮像部1で撮像された画像データを記録する画像メモリ、3は表示部、4は操作部、5は本発明のファイル管理プログラム等が記録されているプログラムメモリ、6はRAM、7は撮像された画像データを圧縮する圧縮部、8は圧縮された画像データを記録するメモ리카ード、9はインタフェース(I/O)、10は処理を行なうプロセッサである。

【0024】なおプログラムメモリ5には本発明のファイル管理プログラムおよび従来例で説明したMS-DOS方式によるデータの記録読出を行なわせるプログラムが記録されている。

【0025】またメモ리카ード8は、図3で説明したマスタブートセクタ領域8Aおよびパーティションセクタ領域8B、FAT8C、ルートディレクトリ領域8Dおよびデータ領域8Eが設けられており、各領域には従来例で説明したデータが記録されている。

【0026】つぎに、図2を参照して、本発明の実施例を説明する。例えば、デジタルカメラの電源がオンになると動作が開始される。ステップS1では、メモ리카ード8のFAT8Cより順次クラスタの使用状況を読み出し、G(グループ)FATをRAM6上に作成する。

【0027】図6はFAT8Cと対応させて示したGFATを示しており、GFATのアドレスをG(グループ)クラスタ番号で表わし、Gクラスタ番号はFATの連続する4クラスタ毎に付与する。

【0028】またGFATのGクラスタ番号に対応する使用状況は、対応するFATの4個のクラスタ番号の使用状況が1個でも使用中のものがあれば「fff」を付

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与し、4個とも未使用であれば使用可である「00x」を付与する。なお「00x」の「x」は次の未使用のGクラスタ番号とする。

【0029】したがって、図6で示すGFATのGクラスタ番号000~002に対応する使用状況は使用中であるため「fff」が記録され、Gクラスタ番号003に対応するクラスタ番号012~015の使用状況は全て未使用であり、また次に未使用のGクラスタ番号005のGクラスタがあるので、Gクラスタ番号003の使用状況には「005」が記録される。

【0030】また、次に未使用のGクラスタが無い場合は、例えばGクラスタ番号005に示すように、「FFF」を記録する。以上のように、ステップS1ではRAM6上にGFATを作成して記録する。

【0031】ステップS2では、ステップS1で作成したGFATに空きのGクラスタが有るか否かを判定し、判定がYESの場合はステップS4に移る。またステップS2での判定がNOの場合はステップS3に移り、Gクラスタを構成するクラスタの数を低減させてステップS1に移りGFATの作成を繰返す。

【0032】すなわち、図6で示したFATの使用状況では、Gクラスタ番号の「003」および「005」に空きがあるのでステップS2での判定はYESとなってステップS4へ移る。

【0033】しかし、いま、図7で示されるようなFATの使用状況においては、最初のGFAT作成結果において空きGクラスタは無く、ステップS2の判定はNOとなる。ステップS2で判定がNOとなった場合はステップS3に移って、最初にGFATを作成したときのクラスタ数4より1低減させて3個のクラスタでGクラスタを構成して再度GFATを作成する。

【0034】クラスタ数を3に低減することによって、Gクラスタ番号「004」および「007」に使用状況が空きのクラスタができる。なおクラスタ数を3にしても空のGクラスタが作成できなかった場合はクラスタ数を2に低減してGクラスタを作成することを繰返す。

【0035】ステップS4では、操作部4よりメモ리카ード8に記録する画像の記録画質モードが変更になったか否かを判定し、判定がNOの場合はステップS3に移り、判定がYESの場合はステップS1に移り、図6で説明したGクラスタ番号に対応するクラスタ数を画質モードに対応して変更し、再度GFATを作成する。

【0036】ステップS5では、操作部4のシャッタが押下されたか否かを判定し、判定がNOの場合はステップS4に移り、ステップS4およびS5が繰返され、判定がYESの場合はステップS6に移る。

【0037】ステップS6では、圧縮部7は、撮像部1で撮像されて画像メモリ2に記録されていた画像データを設定された画質モードに対応して圧縮を行なう。ステップS7では、前述したRAM6に記録されているGF

ATのGクラスタ番号の使用状況を順次読出し、画像データが記録されていない未記録のGクラスタ番号を検索する。

【0038】ステップS7で未記録のGクラスタが検索された場合は、ステップS8に移り、圧縮された画像データを検索されたGクラスタに対応するクラスタに順次記録する。

【0039】すなわち、図6で示す状態においては、先ず最初にGクラスタ番号003が検索され、Gクラスタ番号003に対応するクラスタ番号012~015のクラスタに順次圧縮された画像データが記録される。

【0040】ステップS9では、クラスタ番号012~015のクラスタに画像データを記録しても未だ記録されない圧縮画像データが有るか否かを判定し、判定がYESの場合はステップS7に移り、ステップS7~S9が繰返される。

【0041】第2回目のメモ리카ード8への未記録の圧縮画像データの記録は、第1回目に検索されたGクラスタ番号003の使用状況が「005」であるので、ステップS5での空きGクラスタの検索は行なわず、Gクラスタ番号005に対応するクラスタ番号020~023のクラスタに順次圧縮画像データを記録する。

【0042】また第2回目の記録を行なっても未記録の圧縮画像データがある場合は、第2回目のGクラスタ番号005の使用状況が「FFF」であるので、ステップS7での判定はNOと判定されてステップS11が実行される。

【0043】また、ステップS9での判定がNO、すなわち圧縮画像データが全て記録された場合はステップS10に移り、従来例で説明したMS-DOS方式により記録した画像データに対するルートディレクトリの記録およびFATの記録したクラスタに対する使用状況の変更を行なうと共にGクラスタの使用状況の変更を行なってステップS4に移り、ステップS4~S10が繰返される。

【0044】またステップS9で未記録圧縮画像データが有ると判定され、第3回目のメモ리카ード8への未記録の圧縮画像データが有ると判定された場合は、ステップS7では空きGクラスタが無いと判定されてステップS11に移る。ステップS11では、空きのクラスタが有るか否かをFATをサーチして判定する。

【0045】図6に示されるように、クラスタ番号「005」、「008」、「009」および「018」に空きのクラスタがあるので、ステップS12に移って、従来のMS-DOS方式により未記録の圧縮画像データを順次空きのクラスタに記録するステップS11~S13の処理が実行され、ステップS13で未記録の圧縮画像データが無いと判定された場合はステップS9に移り、ディレクトリ、FATおよびGFATの記録を行なってステップS4に移る。

【0046】またステップS11で空きのクラスタが無いと判定されたときはステップS14に移り、表示部3等にメモリカード8に記録できないことを示す容量オーバーを表示して処理を終了する。

【0047】なお実施例では、ステップS1でのGFATの作成において、Gクラスタの使用状況を、次に空きのGクラスタが有る場合はそのGクラスタ番号を記録するようにしていたが、使用状況に空きであるか否かを記録させ、ステップS7で毎回空きのGクラスタを検索させるようにしてもよい。

【0048】また実施例では記録画質モードによってGクラスタを構成するクラスタの数を変更するようにしていたが、記録媒体または記録媒体の総容量に応じて変更可能にするようにしてもよい。

【0049】また実施例はデジタルカメラで撮像された画像データをメモリカードに記録する場合について説明したが、一般のパーソナルコンピュータ等で記録媒体に情報を記録させる場合に対しても適用することができる。

【0050】

【発明の効果】本発明によれば、記録媒体に記録されているFATより順次所定数のクラスタの使用状況を読み出し、読み出した所定数のクラスタに新たなGクラスタ番号を付与し、付与したGクラスタ番号に対する使用状況を前記読み出したクラスタの使用状況に基づいて付与してGFATを作成し、付与したGクラスタの使用状況が全て使用済である場合は前記所定数を低減させてGFATの*

*作成を繰返し、前記記録媒体への情報の記録時には使用状況が空であるGクラスタ番号を順次サーチし、サーチして得られた空のGクラスタ番号に対応する前記所定数のクラスタ番号のクラスタに連続して情報を記録させるようにしたので、記録媒体へデータを記録する際に空クラスタの検索および論理アドレスの算出をクラスタ毎に行なう必要が無くなり、短時間に多量のデータを記録することができる。

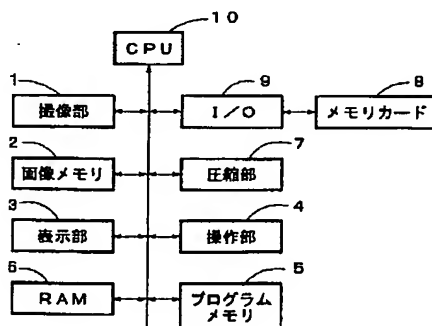
【図面の簡単な説明】

- 10 【図1】本発明の実施例の構成図である。
 【図2】同実施例の動作フローチャートである。
 【図3】メモリカードの構成図である。
 【図4】FATの記録例を示す図である。
 【図5】ルートディレクトリの説明図である。
 【図6】GFATの説明図である。
 【図7】他のGFATの説明図である。

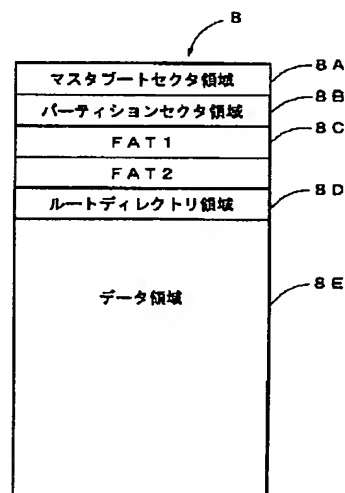
【符号の説明】

- 1 撮像部
 2 画像メモリ
 20 3 表示部
 4 操作部
 5 プログラムメモリ
 6 RAM
 7 圧縮部
 8 メモリカード
 9 インタフェース(I/O)
 10 プロセッサ(CPU)

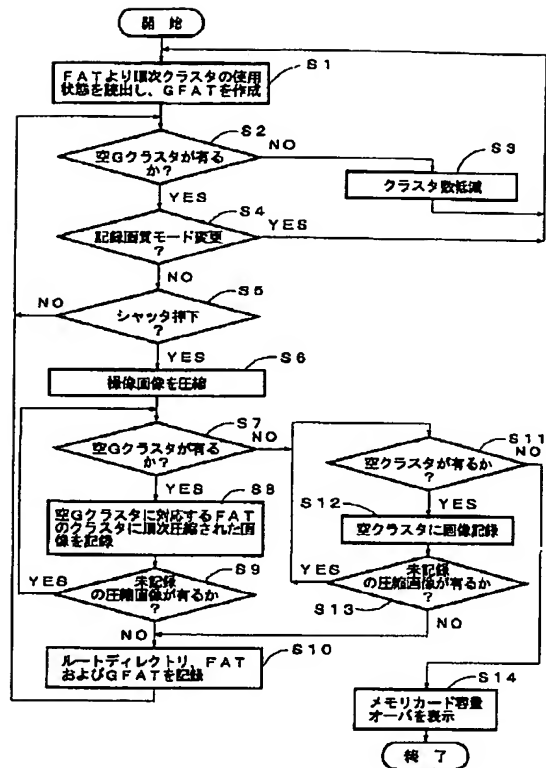
【図1】



【図3】



【図2】



【図4】

FAT	クラスタ番号	000	001	002	003	004	005	006	007
	使用状況	001	002	003	004	006	000	007	FFF

FAT	クラスタ番号	008	009	010	011	012	013	014	015
	使用状況	000	000	011	FFF	000	000	000	000

FAT	クラスタ番号	016	017	018	019	020	021	022	023
	使用状況	017	018	000	FFF	000	000	000	000

⋮

【図5】

ファイル名	拡張子	属性	予約領域	記録時刻	記録日時	開始クラスタ	ファイルサイズ
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【図6】

FAT	クラスタ番号	000	001	002	003	004	005	006	007
	使用状況	001	002	003	004	006	000	007	FFF
GFAT	Gクラスタ番号	000				001			
	使用状況	fff				fff			

FAT	クラスタ番号	008	009	010	011	012	013	014	015
	使用状況	000	000	011	FFF	000	000	000	000
GFAT	Gクラスタ番号	002				003			
	使用状況	fff				005			

FAT	クラスタ番号	016	017	018	019	020	021	022	023
	使用状況	017	019	000	FFF	000	000	000	000
GFAT	Gクラスタ番号	004				005			
	使用状況	fff				FFF			

⋮

【図7】

FAT	クラスタ番号	000	001	002	003	004	005	006	007
	使用状況	001	002	003	004	006	000	007	FFF
GFAT	Gクラスタ番号	000				001			
	使用状況	fff				fff			
GFAT	Gクラスタ番号	000			001			002	
	使用状況	fff			fff			fff	

FAT	クラスタ番号	008	009	010	011	012	013	014	015
	使用状況	000	000	011	FFF	000	000	000	016
GFAT	Gクラスタ番号	002				003			
	使用状況	fff				fff			
GFAT	Gクラスタ番号	002		003		004		005	
	使用状況	fff		fff		007		fff	

FAT	クラスタ番号	016	017	018	019	020	021	022	023
	使用状況	017	019	000	020	FFF	000	000	000
GFAT	Gクラスタ番号	004				005			
	使用状況	fff				fff			
GFAT	Gクラスタ番号	005			006			007	
	使用状況	fff			fff			FFF	

⋮

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CLAIMS

[Claim(s)]

[Claim 1]In a file management program which makes information recorded on a recording medium divided into two or more clusters with an MS-DOS method manage, An operating condition of a cluster of a predetermined number is read one by one from FAT currently recorded on said recording medium, Give new G cluster number to a cluster of a read predetermined number, give an operating condition over given G cluster number based on an operating condition of a cluster which carried out [aforementioned] read-out, and GFAT is created, When all operating conditions of G cluster are used, reduce said predetermined number and creation of GFAT is repeated, A file management program characterized by a thing which is made to record information succeeding a cluster of a cluster number of said predetermined number corresponding to G cluster number of empty obtained by an operating condition searching G cluster number which is empty one by one at the time of record of information on said recording medium, and which were made like.

[Claim 2]When there is no G cluster whose operating condition is empty at the time of record of information on said recording medium, The file management program according to claim 1 characterized by making it make information record on a cluster corresponding to a cluster number of empty obtained from said FAT by an operating condition searching a cluster number which is empty.

[Claim 3]The file management program according to claim 1 or 2 characterized by making it make said GFAT record on a memory different from said recording medium.

[Claim 4]The file management program according to claim 1, 2, or 3 being able to change the number of said clusters which constitute said G cluster according to said recording medium.

[Claim 5]The file management program according to claim 1, 2, or 3 determining the number of said clusters which constitute said G cluster according to the total storage capacity of said recording medium.

[Claim 6]The file management program according to claim 1, 2, or 3 characterized by what a picture quality mode on which a digital camera records the number of said clusters which constitute said G cluster opts for.

[Claim 7]The file management program according to claim 1, 2, 3, 4, or 5, wherein information recorded on said recording medium is the picture information picturized with a digital camera.

[Claim 8]A recording medium which indicated the file management program according to any one of claims 1 to 7.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the file management program and recording medium which make the information recorded on a recording medium by an MS-DOS method manage.

[0002]

[Description of the Prior Art]How to record information on the recording medium by the MS-DOS method currently used conventionally is explained with reference to drawing 3 - drawing 5.

[0003]In drawing 3, 8 shows the memory card which is a recording medium which records information, and 8A is a master boot sector field, Parameters, such as a cylinder, a head track, and a sector track, are recorded, and 8B is a partition sector region, The parameter required for the sector size which is the physical record minimum unit of a recording medium, the sector number per cluster, and DOS file management of FAT (File Allocation Table) several grades is recorded.

[0004]8C is FAT, the operating condition of a cluster is recorded, the copy of FAT1 is recorded on FAT2, and when record of FAT1 is disordered, the value recorded on FAT2 is used.

[0005]8D is a root directory field, and as shown in drawing 5, the file name of the file recorded on the data area of 8E, an extension, an attribute, recording time, a recording date, a start cluster number, a file size, etc. are recorded.

[0006]Drawing 4 shows the example of record of FAT shown in 8C. The address of FAT8C supports the cluster number of the data area 8E, and the operating condition of the cluster corresponding to a cluster number is recorded.

[0007]As shown in drawing 4, the cluster number which, as for "000", un-recording and "FFF" show the cluster which recorded final data and on which, as for the record of those other than

"000" and "FFF", the operating condition is recorded following the next is recorded.

[0008]Then, when the number of the start cluster shown by drawing 5 is "000", the data of this file shows what is recorded on cluster number "000" - "004", "006", and "007", as shown by drawing 4. The start cluster number shows that the file of "010" is recorded on the cluster number "010" and the cluster of "011."

[0009]Therefore, in order to read the data currently recorded on the data area 8E, the file name currently first recorded on the root directory field 8D is searched, and the data currently recorded from the cluster of the data area 8E corresponding to the cluster number which read and read the number of the start cluster is read.

[0010]It accesses whether data is recorded following the cluster read after read-out of data was completed from the cluster at FAT8C, and judges, and when record is except "FFF", read-out of the data currently recorded on the cluster corresponding to the cluster number currently recorded is continued.

[0011]When recording new file data, the address of FAT8C is searched one by one from a head, and an operating condition records data on the cluster which found out and found out the cluster of "000, i.e., un-recording."

[0012]Therefore, when shown by drawing 4, data is recorded on the cluster number "005" of the data area 8E, and the cluster number "008" which is not recorded [of the next] is recorded on the operating condition of FAT8C, and file data is recorded on the cluster number "008" of the data area 8E.

[0013]After record of file data is completed, the operating condition corresponding to the cluster number of FAT8C on which final data was recorded is recorded as "FFF", and it ends.

[0014]

[Problem(s) to be Solved by the Invention]When recording data on a recording medium with an MS-DOS method, As mentioned above, when "000" which shows that they are vacant regions is searched and "000" is found from FAT, from the cluster number, it asks for the logical address of a recording medium, and writes in to the called-for logical address.

[0015]The DOS parameter currently recorded on the partition sector region 8A mentioned above performs calculation of a logical address from a cluster number. Therefore, when one file is constituted by two or more clusters, it is necessary to perform search of an empty cluster, and calculation of a logical address for every cluster, and file recording processing takes a long time.

[0016]Although the size of a cluster can be changed with a DOS parameter, if a cluster size is enlarged, the number of times which search of an empty cluster and a logical address compute decreases, and can reduce file recording processing time, but. Since a cluster is the minimum record unit, if a cluster size is enlarged more than needed, the vacant regions where data is not recorded on the cluster on which the last data of a file is recorded will occur, and it will

reduce the utilization ratio of a recording medium.

[0017]This invention makes it a technical problem to provide the file management program and recording medium which enabled it to record a lot of data of the image data etc. which were picturized with the digital camera on a recording medium for a short time.

[0018]

[Means for Solving the Problem]In a file management program which makes information recorded on a recording medium divided into two or more clusters with an MS-DOS method in an invention of claim 1 manage, An operating condition of a cluster of a predetermined number is read one by one from FAT currently recorded on said recording medium, Give new G cluster number to a cluster of a read predetermined number, give an operating condition over given G cluster number based on an operating condition of a cluster which carried out

[aforementioned] read-out, and GFAT is created, When all operating conditions of G cluster are used, reduce said predetermined number and creation of GFAT is repeated, Information is made to record succeeding a cluster of a cluster number of said predetermined number corresponding to G cluster number of empty obtained by an operating condition searching G cluster number which is empty one by one at the time of record of information on said recording medium.

[0019]When there is no G cluster whose operating condition is empty at the time of record of information on said recording medium, information is made to record on a cluster corresponding to a cluster number of the sky where an operating condition was acquired from said FAT by searching a cluster number which is empty in an invention of claim 2. Said GFAT is made to record on a memory different from said recording medium in an invention of claim 3.

[0020]In an invention of claim 4, change of the number of said clusters which constitute said G cluster is enabled according to said recording medium. In an invention of claim 5, the number of said clusters which constitute said G cluster is determined according to the total storage capacity of said recording medium.

[0021]In an invention of claim 6, a picture quality mode which a digital camera records determines the number of said clusters which constitute said G cluster. In an invention of claim 7, information recorded on said recording medium considers it as picture information picturized with a digital camera.

[0022]

[Embodiment of the Invention]An embodiment of the invention is described with reference to drawing 1 - drawing 6. As for the lineblock diagram of a memory card, and drawing 4, the lineblock diagram of the example of this invention and drawing 2 are [drawing 1 / the operation flow chart of the example, and drawing 3 / the explanatory view of a root directory and drawing 6 of the example of record of FAT and drawing 5] the explanatory views of GFAT.

[0023]Drawing 1 is a lineblock diagram of the example which applied this invention to the digital camera, and 1 An image pick-up part, The image memory on which 2 records the image data picturized in the image pick-up part 1, and 3 An indicator, The program memory on which a final controlling element is recorded 4 and the file management program of this invention, etc. are recorded 5, It is a processor in which the compression zone into which 6 compresses RAM and the image data by which seven were picturized, the memory card which records the image data into which 8 was compressed, and 9 interface with (I/O), and 10 processes.

[0024]The program to which record read-out of the data based on the MS-DOS method explained by the file management program and conventional example of this invention is made to carry out is recorded on the program memory 5.

[0025]The master boot sector field 8A which explained the memory card 8 by drawing 3 and the partition sector region 8B, FAT8C, the root directory field 8D, and the data area 8E are formed, and the data explained by the conventional example is recorded on each field.

[0026]Below, the example of this invention is described with reference to drawing 2. For example, operation will be started if the power supply of a digital camera is turned on. In Step S1, from FAT8C of the memory card 8, the operating condition of a cluster is read one by one, and G(group) FAT is created on RAM6.

[0027]GFAT which drawing 6 made correspond with FAT8C, and was shown is shown, the address of GFAT is expressed with G (group) cluster number, and G cluster number is given every 4 which FAT follows clusters.

[0028]The operating condition corresponding to G cluster number of GFAT will give "fff", if a thing in use has at least one operating condition of the cluster number of four pieces of corresponding FAT, and if intact four pieces, it will give "00x" which can be used. "x" of "00x" is taken as the following intact G cluster number.

[0029]Therefore, since the operating condition corresponding to the G cluster numbers 000-002 of GFAT shown by drawing 6 is under use "fff", it is recorded, Since all of the operating condition of the cluster numbers 012-015 corresponding to the G cluster number 003 have G cluster of the G cluster number 005 intact next intact, "005" is recorded on the operating condition of the G cluster number 003.

[0030]When there is no G cluster intact next, "FFF" is recorded as shown, for example in the G cluster number 005. As mentioned above, at Step S1, GFAT is created and recorded on RAM6.

[0031]In Step S2, it judges whether GFAT created at Step S1 has an empty G cluster, and when a judgment is YES, it moves to step S4. When a judgment at Step S2 is NO, it moves to Step S3, and the number of the clusters which constitute G cluster is reduced, it moves to Step S1, and creation of GFAT is repeated.

[0032]That is, in the operating condition of FAT shown by drawing 6, since "003" of G cluster

number and "005" have an opening, a judgment at Step S2 serves as YES, and it moves from it to step S4.

[0033]However, in the operating condition of FAT as shown by drawing 7, in the first GFAT creation result, it is vacant, there is no G cluster, and the judgment of Step S2 serves as NO now. When a judgment is set to NO at Step S2, it moves to Step S3, and from the cluster number 4 when GFAT is created first, it is made to decrease one time, G cluster is constituted from three clusters, and GFAT is created again.

[0034]By reducing a cluster number to 3, the cluster whose operating condition is an opening is made to G cluster number "004" and "007." When empty G cluster becomes unable to create a cluster number as for 3, it repeats reducing a cluster number to 2 and creating G cluster.

[0035]It is judged whether in step S4, the recording image quality mode of the picture recorded on the memory card 8 from the final controlling element 4 was changed, When a judgment is NO, it moves to Step S3, when a judgment is YES, it moves to Step S1, and the cluster number corresponding to G cluster number explained by drawing 6 is changed corresponding to a picture quality mode, and GFAT is created again.

[0036]In Step S5, it judges whether the shutter of the final controlling element 4 was pushed, when a judgment is NO, it moves to step S4, step S4 and S5 are repeated, and when a judgment is YES, it moves to Step S6.

[0037]In Step S6, the compression zone 7 is picturized in the image pick-up part 1, and compresses corresponding to the picture quality mode set up in the image data currently recorded on the image memory 2. The operating condition of G cluster number of GFAT currently recorded on RAM6 mentioned above is read one by one, and G cluster number which is not recorded [on which image data is not recorded] is searched with Step S7.

[0038]When unrecorded G cluster is searched with Step S7, it records on the cluster corresponding to G cluster which had the image data moved and compressed into Step S8 searched one by one.

[0039]That is, in the state which shows by drawing 6, the G cluster number 003 is searched first and the image data compressed into the cluster of the cluster numbers 012-015 corresponding to the G cluster number 003 one by one is recorded.

[0040]In step S9, it judges whether there is any compressed image data which is not yet recorded even if it records image data on the cluster of the cluster numbers 012-015, when a judgment is YES, it moves to Step S7, and Step S7 - S9 are repeated.

[0041]Record of the compressed image data which is not recorded on the 2nd memory card 8, Since the operating condition of the G cluster number 003 searched by the 1st time is "005", search of empty G cluster in Step S5 is not performed, but compressed image data is recorded on the cluster of the cluster numbers 020-023 corresponding to the G cluster number 005 one

by one.

[0042]Since the with a G cluster number [2nd / 005] operating condition is "FFF" when there is unrecorded compressed image data, even if it performs 2nd record, a judgment at Step S7 is judged to be NO, and Step S11 is performed.

[0043]The judgment by step S9 moves to Step S10, when all NO(s), i.e., compressed image data, are recorded, The operating condition over the cluster which record of the root directory to the image data recorded with the MS-DOS method explained by the conventional example and FAT recorded is changed, and the operating condition of G cluster is changed, it moves to step S4, and step S4 - S10 are repeated.

[0044]When it is judged with there being unrecorded compressed image data by step S9 and is judged with there being compressed image data which is not recorded on the 3rd memory card 8, at Step S7, it is vacant, it is judged with there being no G cluster, and moves to Step S11. In Step S11, FAT is searched and it is judged whether there is any empty cluster.

[0045]Since a cluster number "005", "008", "009", and "018" have an empty cluster as shown in drawing 6, Move to Step S12 and processing of Steps S11-S13 which record unrecorded compressed image data on an empty cluster one by one with the conventional MS-DOS method is performed, When judged with there being no unrecorded compressed image data at Step S13, it moves to step S9, and record of a directory, FAT, and GFAT is performed and it moves to step S4.

[0046]When judged with there being no empty cluster at Step S11, it moves to Step S14, and capacity Oba which shows a thing unrecordable on the memory card 8 at indicator 3 grade is displayed, and processing is ended.

[0047]When there was an empty G cluster next about the operating condition of G cluster, were trying to record the G cluster number in creation of GFAT in Step S1 in an example, but. It makes it record on an operating condition whether it is an opening, and may be made to make empty G cluster search with Step S7 each time.

[0048]Although he was trying to change the number of the clusters which constitute G cluster from an example by recording image quality mode, according to the total capacity of a recording medium or a recording medium, it may be made to make a change possible.

[0049]Although the example explained the case where the image data picturized with the digital camera was recorded on a memory card, it is applicable to a recording medium also to the case where information is made to record, with a common personal computer etc.

[0050]

[Effect of the Invention]According to this invention, the operating condition of the cluster of a predetermined number is read one by one from FAT currently recorded on the recording medium, Give new G cluster number to the cluster of the read predetermined number, give the operating condition over given G cluster number based on the operating condition of the

cluster which carried out [aforementioned] read-out, and GFAT is created, When all the operating conditions of given G cluster are used, reduce said predetermined number and creation of GFAT is repeated, Since it was made to make information record succeeding the cluster of the cluster number of said predetermined number corresponding to G cluster number of the empty which the operating condition searched G cluster number which is empty one by one at the time of record of the information on said recording medium, and was produced by searching, When recording data on a recording medium, the necessity of performing search of an empty cluster and calculation of a logical address for every cluster is lost, and a lot of data can be recorded in a short time.

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TECHNICAL FIELD

[Field of the Invention]This invention relates to the file management program and recording medium which make the information recorded on a recording medium by an MS-DOS method manage.

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PRIOR ART

[Description of the Prior Art]How to record information on the recording medium by the MS-DOS method currently used conventionally is explained with reference to drawing 3 - drawing 5.

[0003]In drawing 3, 8 shows the memory card which is a recording medium which records information, and 8A is a master boot sector field, Parameters, such as a cylinder, a head track, and a sector track, are recorded, and 8B is a partition sector region, The parameter required for the sector size which is the physical record minimum unit of a recording medium, the sector number per cluster, and DOS file management of FAT (File Allocation Table) several grades is recorded.

[0004]8C is FAT, the operating condition of a cluster is recorded, the copy of FAT1 is recorded on FAT2, and when record of FAT1 is disordered, the value recorded on FAT2 is used.

[0005]8D is a root directory field, and as shown in drawing 5, the file name of the file recorded on the data area of 8E, an extension, an attribute, recording time, a recording date, a start cluster number, a file size, etc. are recorded.

[0006]Drawing 4 shows the example of record of FAT shown in 8C. The address of FAT8C supports the cluster number of the data area 8E, and the operating condition of the cluster corresponding to a cluster number is recorded.

[0007]As shown in drawing 4, the cluster number which, as for "000", un-recording and "FFF" show the cluster which recorded final data and on which, as for the record of those other than "000" and "FFF", the operating condition is recorded following the next is recorded.

[0008]Then, when the number of the start cluster shown by drawing 5 is "000", the data of this file shows what is recorded on cluster number "000" - "004", "006", and "007", as shown by drawing 4. The start cluster number shows that the file of "010" is recorded on the cluster number "010" and the cluster of "011."

[0009]Therefore, in order to read the data currently recorded on the data area 8E, the file

name currently first recorded on the root directory field 8D is searched, and the data currently recorded from the cluster of the data area 8E corresponding to the cluster number which read and read the number of the start cluster is read.

[0010]It accesses whether data is recorded following the cluster read after read-out of data was completed from the cluster at FAT8C, and judges, and when record is except "FFF", read-out of the data currently recorded on the cluster corresponding to the cluster number currently recorded is continued.

[0011]When recording new file data, the address of FAT8C is searched one by one from a head, and an operating condition records data on the cluster which found out and found out the cluster of "000, i.e., un-recording."

[0012]Therefore, when shown by drawing 4, data is recorded on the cluster number "005" of the data area 8E, and the cluster number "008" which is not recorded [of the next] is recorded on the operating condition of FAT8C, and file data is recorded on the cluster number "008" of the data area 8E.

[0013]After record of file data is completed, the operating condition corresponding to the cluster number of FAT8C on which final data was recorded is recorded as "FFF", and it ends.

[Translation done.]

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EFFECT OF THE INVENTION

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]When recording data on a recording medium with an MS-DOS method, As mentioned above, when "000" which shows that they are vacant regions is searched and "000" is found from FAT, from the cluster number, it asks for the logical address of a recording medium, and writes in to the called-for logical address.

[0015]The DOS parameter currently recorded on the partition sector region 8A mentioned above performs calculation of a logical address from a cluster number. Therefore, when one file is constituted by two or more clusters, it is necessary to perform search of an empty cluster, and calculation of a logical address for every cluster, and file recording processing takes a long time.

[0016]Although the size of a cluster can be changed with a DOS parameter, if a cluster size is enlarged, the number of times which search of an empty cluster and a logical address compute decreases, and can reduce file recording processing time, but. Since a cluster is the minimum record unit, if a cluster size is enlarged more than needed, the vacant regions where data is not recorded on the cluster on which the last data of a file is recorded will occur, and it will reduce the utilization ratio of a recording medium.

[0017]This invention makes it a technical problem to provide the file management program and recording medium which enabled it to record a lot of data of the image data etc. which were picturized with the digital camera on a recording medium for a short time.

[Translation done.]

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MEANS

[Means for Solving the Problem]In a file management program which makes information recorded on a recording medium divided into two or more clusters with an MS-DOS method in an invention of claim 1 manage, An operating condition of a cluster of a predetermined number is read one by one from FAT currently recorded on said recording medium, Give new G cluster number to a cluster of a read predetermined number, give an operating condition over given G cluster number based on an operating condition of a cluster which carried out [aforementioned] read-out, and GFAT is created, When all operating conditions of G cluster are used, reduce said predetermined number and creation of GFAT is repeated, Information is made to record succeeding a cluster of a cluster number of said predetermined number corresponding to G cluster number of empty obtained by an operating condition searching G cluster number which is empty one by one at the time of record of information on said recording medium.

[0019]When there is no G cluster whose operating condition is empty at the time of record of information on said recording medium, information is made to record on a cluster corresponding to a cluster number of the sky where an operating condition was acquired from said FAT by searching a cluster number which is empty in an invention of claim 2. Said GFAT is made to record on a memory different from said recording medium in an invention of claim 3.

[0020]In an invention of claim 4, change of the number of said clusters which constitute said G cluster is enabled according to said recording medium. In an invention of claim 5, the number of said clusters which constitute said G cluster is determined according to the total storage capacity of said recording medium.

[0021]In an invention of claim 6, a picture quality mode which a digital camera records determines the number of said clusters which constitute said G cluster. In an invention of claim 7, information recorded on said recording medium considers it as picture information picturized

with a digital camera.

[0022]

[Embodiment of the Invention]An embodiment of the invention is described with reference to drawing 1 - drawing 6. As for the lineblock diagram of a memory card, and drawing 4, the lineblock diagram of the example of this invention and drawing 2 are [drawing 1 / the operation flow chart of the example, and drawing 3 / the explanatory view of a root directory and drawing 6 of the example of record of FAT and drawing 5] the explanatory views of GFAT.

[0023]Drawing 1 is a lineblock diagram of the example which applied this invention to the digital camera, and 1 An image pick-up part, The image memory on which 2 records the image data picturized in the image pick-up part 1, and 3 An indicator, The program memory on which a final controlling element is recorded 4 and the file management program of this invention, etc. are recorded 5, It is a processor in which the compression zone into which 6 compresses RAM and the image data by which seven were picturized, the memory card which records the image data into which 8 was compressed, and 9 interface with (I/O), and 10 processes.

[0024]The program to which record read-out of the data based on the MS-DOS method explained by the file management program and conventional example of this invention is made to carry out is recorded on the program memory 5.

[0025]The master boot sector field 8A which explained the memory card 8 by drawing 3 and the partition sector region 8B, FAT8C, the root directory field 8D, and the data area 8E are formed, and the data explained by the conventional example is recorded on each field.

[0026]Below, the example of this invention is described with reference to drawing 2. For example, operation will be started if the power supply of a digital camera is turned on. In Step S1, from FAT8C of the memory card 8, the operating condition of a cluster is read one by one, and G(group) FAT is created on RAM6.

[0027]GFAT which drawing 6 made correspond with FAT8C, and was shown is shown, the address of GFAT is expressed with G (group) cluster number, and G cluster number is given every 4 which FAT follows clusters.

[0028]The operating condition corresponding to G cluster number of GFAT will give "fff", if a thing in use has at least one operating condition of the cluster number of four pieces of corresponding FAT, and if intact four pieces, it will give "00x" which can be used. "x" of "00x" is taken as the following intact G cluster number.

[0029]Therefore, since the operating condition corresponding to the G cluster numbers 000-002 of GFAT shown by drawing 6 is under use "fff", it is recorded, Since all of the operating condition of the cluster numbers 012-015 corresponding to the G cluster number 003 have G cluster of the G cluster number 005 intact next intact, "005" is recorded on the operating condition of the G cluster number 003.

[0030]When there is no G cluster intact next, "FFF" is recorded as shown, for example in the G

cluster number 005. As mentioned above, at Step S1, GFAT is created and recorded on RAM6.

[0031]In Step S2, it judges whether GFAT created at Step S1 has an empty G cluster, and when a judgment is YES, it moves to step S4. When a judgment at Step S2 is NO, it moves to Step S3, and the number of the clusters which constitute G cluster is reduced, it moves to Step S1, and creation of GFAT is repeated.

[0032]That is, in the operating condition of FAT shown by drawing 6, since "003" of G cluster number and "005" have an opening, a judgment at Step S2 serves as YES, and it moves from it to step S4.

[0033]However, in the operating condition of FAT as shown by drawing 7, in the first GFAT creation result, it is vacant, there is no G cluster, and the judgment of Step S2 serves as NO now. When a judgment is set to NO at Step S2, it moves to Step S3, and from the cluster number 4 when GFAT is created first, it is made to decrease one time, G cluster is constituted from three clusters, and GFAT is created again.

[0034]By reducing a cluster number to 3, the cluster whose operating condition is an opening is made to G cluster number "004" and "007." When empty G cluster becomes unable to create a cluster number as for 3, it repeats reducing a cluster number to 2 and creating G cluster.

[0035]It is judged whether in step S4, the recording image quality mode of the picture recorded on the memory card 8 from the final controlling element 4 was changed, When a judgment is NO, it moves to Step S3, when a judgment is YES, it moves to Step S1, and the cluster number corresponding to G cluster number explained by drawing 6 is changed corresponding to a picture quality mode, and GFAT is created again.

[0036]In Step S5, it judges whether the shutter of the final controlling element 4 was pushed, when a judgment is NO, it moves to step S4, step S4 and S5 are repeated, and when a judgment is YES, it moves to Step S6.

[0037]In Step S6, the compression zone 7 is picturized in the image pick-up part 1, and compresses corresponding to the picture quality mode set up in the image data currently recorded on the image memory 2. The operating condition of G cluster number of GFAT currently recorded on RAM6 mentioned above is read one by one, and G cluster number which is not recorded [on which image data is not recorded] is searched with Step S7.

[0038]When unrecorded G cluster is searched with Step S7, it records on the cluster corresponding to G cluster which had the image data moved and compressed into Step S8 searched one by one.

[0039]That is, in the state which shows by drawing 6, the G cluster number 003 is searched first and the image data compressed into the cluster of the cluster numbers 012-015 corresponding to the G cluster number 003 one by one is recorded.

[0040]In step S9, it judges whether there is any compressed image data which is not yet recorded even if it records image data on the cluster of the cluster numbers 012-015, when a judgment is YES, it moves to Step S7, and Step S7 - S9 are repeated.

[0041]Record of the compressed image data which is not recorded on the 2nd memory card 8, Since the operating condition of the G cluster number 003 searched by the 1st time is "005", search of empty G cluster in Step S5 is not performed, but compressed image data is recorded on the cluster of the cluster numbers 020-023 corresponding to the G cluster number 005 one by one.

[0042]Since the with a G cluster number [2nd / 005] operating condition is "FFF" when there is unrecorded compressed image data, even if it performs 2nd record, a judgment at Step S7 is judged to be NO, and Step S11 is performed.

[0043]The judgment by step S9 moves to Step S10, when all NO(s), i.e., compressed image data, are recorded, The operating condition over the cluster which record of the root directory to the image data recorded with the MS-DOS method explained by the conventional example and FAT recorded is changed, and the operating condition of G cluster is changed, it moves to step S4, and step S4 - S10 are repeated.

[0044]When it is judged with there being unrecorded compressed image data by step S9 and is judged with there being compressed image data which is not recorded on the 3rd memory card 8, at Step S7, it is vacant, it is judged with there being no G cluster, and moves to Step S11. In Step S11, FAT is searched and it is judged whether there is any empty cluster.

[0045]Since a cluster number "005", "008", "009", and "018" have an empty cluster as shown in drawing 6, Move to Step S12 and processing of Steps S11-S13 which record unrecorded compressed image data on an empty cluster one by one with the conventional MS-DOS method is performed, When judged with there being no unrecorded compressed image data at Step S13, it moves to step S9, and record of a directory, FAT, and GFAT is performed and it moves to step S4.

[0046]When judged with there being no empty cluster at Step S11, it moves to Step S14, and capacity Oba which shows a thing unrecordable on the memory card 8 at indicator 3 grade is displayed, and processing is ended.

[0047]When there was an empty G cluster next about the operating condition of G cluster, were trying to record the G cluster number in creation of GFAT in Step S1 in an example, but. It makes it record on an operating condition whether it is an opening, and may be made to make empty G cluster search with Step S7 each time.

[0048]Although he was trying to change the number of the clusters which constitute G cluster from an example by recording image quality mode, according to the total capacity of a recording medium or a recording medium, it may be made to make a change possible.

[0049]Although the example explained the case where the image data picturized with the

digital camera was recorded on a memory card, it is applicable to a recording medium also to the case where information is made to record, with a common personal computer etc.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]It is a lineblock diagram of the example of this invention.

[Drawing 2]It is an operation flow chart of the example.

[Drawing 3]It is a lineblock diagram of a memory card.

[Drawing 4]It is a figure showing the example of record of FAT.

[Drawing 5]It is an explanatory view of a root directory.

[Drawing 6]It is an explanatory view of GFAT.

[Drawing 7]It is an explanatory view of other GFAT(s).

[Description of Notations]

1 Image pick-up part

2 Image memory

3 Indicator

4 Final controlling element

5 Program memory

6 RAM

7 Compression zone

8 Memory card

9 Interface (I/O)

10 Processor (CPU)

[Translation done.]

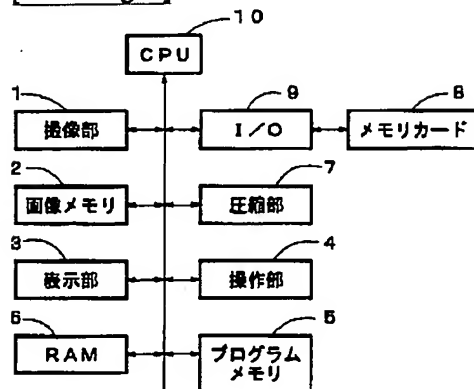
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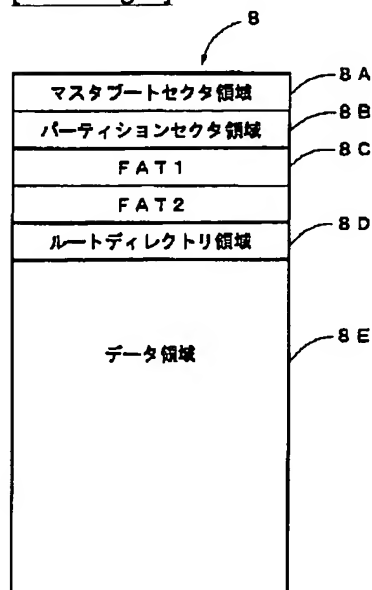
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DRAWINGS

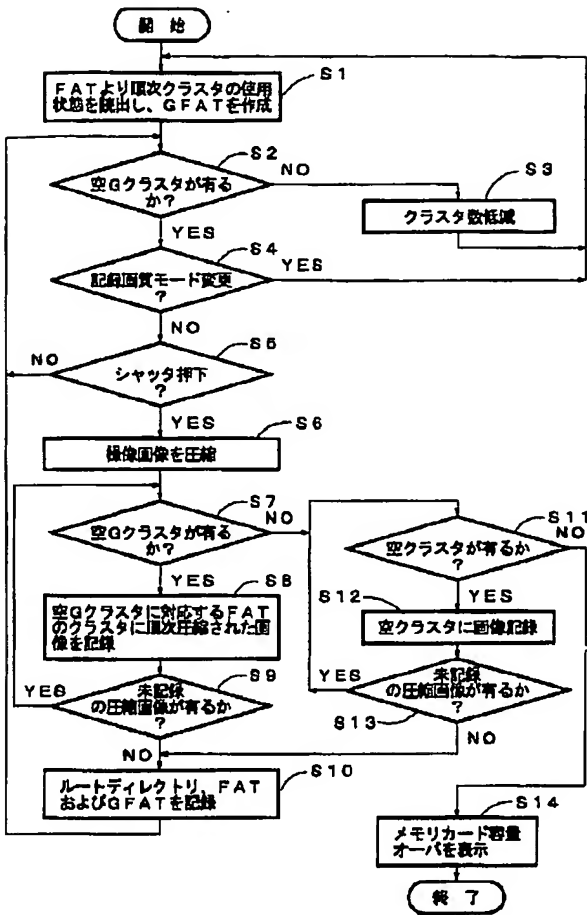
[Drawing 1]



[Drawing 3]



[Drawing 2]



[Drawing 4]

FAT	クラスタ番号	000	001	002	003	004	005	006	007
	使用状況	001	002	003	004	006	000	007	FFF

FAT	クラスタ番号	008	009	010	011	012	013	014	015
	使用状況	000	000	011	FFF	000	000	000	000

FAT	クラスタ番号	016	017	018	019	020	021	022	023
	使用状況	017	018	000	FFF	000	000	000	000

⋮

[Drawing 5]

ファイル名	拡張子	属性	予約領域	記録時刻	記録日時	開始クラスタ	ファイルサイズ
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[Drawing 6]

FAT	クラスタ番号	000	001	002	003	004	006	006	007
	使用状況	001	002	003	004	006	000	007	FFF
GFAT	Gクラスタ番号	000				001			
	使用状況	fff				fff			

FAT	クラスタ番号	008	009	010	011	012	013	014	015
	使用状況	000	000	011	FFF	000	000	000	000
GFAT	Gクラスタ番号	002				003			
	使用状況	fff				005			

FAT	クラスタ番号	016	017	018	019	020	021	022	023
	使用状況	017	018	000	FFF	000	000	000	000
GFAT	Gクラスタ番号	004				005			
	使用状況	fff				FFF			

⋮

[Drawing 7]

FAT	クラスタ番号	000	001	002	003	004	005	006	007
	使用状況	001	002	003	004	006	000	007	FFF
GFAT	Gクラスタ番号	000				001			
	使用状況	fff				fff			
GFAT	Gクラスタ番号	000			001			002	
	使用状況	fff			fff			fff	

FAT	クラスタ番号	008	009	010	011	012	013	014	015
	使用状況	000	000	011	FFF	000	000	000	016
GFAT	Gクラスタ番号	002				003			
	使用状況	fff				fff			
GFAT	Gクラスタ番号	002	003			004			005
	使用状況	fff	fff			007			fff

FAT	クラスタ番号	016	017	018	019	020	021	022	023
	使用状況	017	018	000	020	FFF	000	000	000
GFAT	Gクラスタ番号	004				005			
	使用状況	fff				fff			
GFAT	Gクラスタ番号	005			006			007	
	使用状況	fff			fff			FFF	

⋮

[Translation done.]